

Weatherby Lake 5 Year Road Plan #3

Revised September 2011

Introduction

This Road Plan is an update to the plan issued in September 2009 as part of the continuing assessment of road conditions. The roads are assessed every two or more years, more frequently if needed, in order to provide an objective, flexible and sound long range (5 year) plan to maintain the roads in good condition. The first road plan was approved by the Board of Aldermen in March 2009. Because the price for asphalt was considerably below our planning amount (\$70 per ton plan, \$51 per ton actual) the Council approved doing both the 2009 and 2010 planned road work. Therefore it was determined that we should issue this updated as Road Plan #3 for the next five years. The format of this plan remains the same as the first plan with three elements: 1) an objective assessment of the condition of the road, 2) a management approach to select what will be done to the roads and the associated costs and 3) the planned work by year listing the specific roads for refurbishment.

Technical Assessment

To objectively assess the condition of the roads, we will continue to use the MODOT suggested Transportation Information Center, University of Wisconsin Pavement Surface Evaluation and Rating (PASER) Manual for asphalt roads. This document provides a rating system for asphalt roads describing the conditions, providing pictures of what to look for, and in some cases making suggestions of the type of resurfacing which is applicable.

George Lowman, Jerry Bos and Vic DeJong inspected every road in the City in July 2011. The PASER Manual rating system was applied to each street. In some cases a street was divided to provide different ratings due to conditions resulting from the timing of the last resurfacing. The streets and their updated respective ratings are provided as Attachment 1. A summary of the PASER Manual rating system is also provided as Attachment 2.

George Lowman provided a history of when the roads were last resurfaced and the estimated thickness of the road base. It should be recognized that this "base thickness" is simply the previous layers of asphalt. There are only a few streets that have a gravel base, a base layer of asphalt and then a finishing cap. The road history and thickness is provided in Attachment 1.

The life of a given road is dependent upon a number of factors such as amount of traffic, thickness of the road base, failure of the road edge, water infiltration through or under the road itself and winter freeze thaw cycles. Looking at the history and the current ratings, it is a reasonable conclusion that many residential roads can last up to 20 years and in some instances have lasted even longer (e.g. south section of Roberts Road). It is the intent to

work toward streets that will routinely achieve a 20 year life or longer. It also is apparent that roads with high rates of traffic such as Eastside Drive do not last that long.

There are various “maintenance” techniques that can be applied to extend the life of the road. Basic periodic crack sealing is probably the best method to minimize the water infiltration that can soften the ground under the road and cause major damage. The City plans to conduct crack sealing every fall to the extent possible given the priorities of other work and the weather conditions.

Management Approach

Goal

The goal of this plan is the same as the first plan: to provide roads which are in the best condition for the longest period of time. All roads are important as they make an obvious statement about the community; the basis for which roads are repaired will continue to be determined by volume of traffic and condition. Based on the current assessment it is judged that resurfacing would be required in 2012 and 2015 on certain streets. As with all plans before any action is taken a reassessment will be made prior to initiating the work

Funding

There are three funding sources for the roads. One is the road districts’ funding of approximately \$25,000 per year, another is the general fund of approximately \$110,000 per year and the other is from a special Platte County sales tax of approximately \$84,000 per year. In general, we use road district and general funds for patching, and repairs and we use the sales tax funding for major road work such as resurfacing and replacement. The sales tax expires in 2011 and for planning purposes it was assumed that the sales tax will be continued. The funds accumulated and available from the sales tax as of August 2011 are approximately \$430,000 and by 2015 an additional \$336,000 will accumulate.

Priority

For planning purposes the following is the priority (same as prior plans)

1. Roads with the lowest condition ratings will be resurfaced first.
2. Roads with the highest traffic will be repaired before there is major deterioration.
3. Roads with extensive patching due to water main leaks, culvert or water line replacement, road patches due to road deterioration, and mobilization savings may be grounds for resurfacing.
4. A preventive maintenance crack sealing approach will be applied to minimize road deterioration. Action to prolong the life of the road with surface sealants will be performed when it is economically justified.
5. Construction activities in the city will be monitored for deleterious effects on the roads, appropriate action taken, and the planning process adjusted accordingly.
6. Water erosion issues will be addressed on a continuing basis.

It will be the policy of the city to conduct a systematic review of the roads at least every two years. The assessment will be documented as a modification to attachment 1.

Cost Options

All costs are in 2011 dollars. For this plan asphalt costs are assumed to be \$70 per ton in 2012 and \$85 per ton in 2015. This compares to approximately \$56 per ton actual cost this year based on road district work in this area. The key factor in the cost of asphalt is the price of oil. Milling costs are assumed to be \$2.00 per square yard in 2012 and \$2.50 per square yard in 2015. Vender supplied cost estimates for this year is \$1.50 per square yard.

There are four basic options which were evaluated as ways in which to construct satisfactory roads and they are in order from highest cost to lowest cost:

1. Reconstruction – this is rebuilding the road from scratch using MODOT standards for highways. This would include a gravel base of 4-6 inches, an asphalt base of at least 6 inches and a 2 inch asphalt cap. In Weatherby Lake we have very few roads of this construction. If new roads are to be installed it is desirable that they be constructed in this manner. Residential roads constructed in this manner should last more than 20 years.
2. Limited Reconstruction – this is rebuilding the road with the asphalt laid directly onto the ground. This is usually a 6 inch base and a 2 inch cap. This is usually sufficient for residential roads if the water can be kept from the ground under the asphalt. The higher traffic roads in the City are constructed in this manner. Any rebuilt roads should be constructed in this way as a minimum. Such roads should last as long as 20 years with minimal maintenance.
3. Resurfacing – this includes patching damaged asphalt that indicates base deterioration, milling the road, and putting a 2 inch layer of asphalt on the existing road. In the past, PetroMat was put on the road surface and an additional 2 inch cap of asphalt applied. Additional experience indicates that milling the entire surface may be a better approach. The cost differential slightly favors milling and this plan is based on the milling cost. When the resurfacing is performed it is normally preceded by correcting any drainage issues such as culvert replacement and ditch grading. Depending upon the base, this type of road may last 20 years with minimal cost.
4. Sealing – there are a number of sealing methods designed to extend the life of a road and these include such technologies as Slurry Seal, Micro Surfacing and Chip Seal. In general all of these apply a tar and fine aggregate types of material from ¼ to ½ inch in thickness to the existing road surface. The idea of all these applications is to prevent road wear and to minimize the sunlight deterioration of the asphalt. These technologies depend totally on the road base to support them; if the road has cracks these applications will not prevent or seal the cracks. This type of resurfacing is usually good for a few years, potentially as much as 8 years (per the vender) if the base is sufficiently strong. These technologies and new technologies continue to become available. They will be used on the streets where

there is good evidence that they will work in our application and be cost effective in extending the life of the road.

The Plan

Based on the technical assessment, the management approach, and available funds; the plan is to commence repair of deteriorated sections to the roads in the fall of 2011 in preparation for resurfacing the next set of roads in 2012. The 2012 roads planned are those that are in excess of 20 years old and/or have current scores of a 5 or lower. The same criterion is used for 2015 road work. Striping is planned for Eastside road work only. A survey will be conducted early in 2012 to verify the condition of the roads and make adjustments as appropriate. Another survey will be conducted in 2014 to assess the condition of the roads and plan for the resurfacing for 2015. The planned resurfacing is as follows:

2012 –Resurfacing in this year would be for roads older than 20 years and/or have score of 5 or lower and would consist of a 2 inch cap and complete milling of the roads. These are Eastside Drive (score 5, 1993) from 75th Terrace to just past 76th Terrace, 78th Street (score 4, 1989) east of Eastside Dr, and Kerns (score 4, 1997). Two streets will be rebuilt as the deterioration has accelerated due to water main leaks or water infiltration. These streets are 77 Street (score 2, 1989) and 76th Terrace (score 3, 1989). The repair on 77th street will consist of a new base either 6 inches of asphalt or 6 inches of gravel with 6 inches of asphalt and a 2 inch cap. For 76th Terrace a test case is to be considered. The street has significant concrete repair and rather than removing that to utilize asphalt consideration is being given to rebuild the road as a concrete road using city employees. This could save approximately \$10,000; however, for planning purposes the cost utilizes asphalt. The estimated cost for this 2012 plan, including patching of other streets, is approximately \$284,952. Funds will be available to cover this amount, see Funding subsection above.

2015 – Resurfacing in this year would be planned for roads older than 20 years and/or that have a score of 6 or lower. These are Roberts Rd South (score 7, 1989), Lynns Lane (score 7, 1989), Barr Lane South of 7912 (score 6, 1997). Moser (score 7, 1989) is a concrete road that only services one house and will be evaluated in 2014. Estimated cost including patching of other streets is approximately \$233,905. Funds will be available to cover this amount, see Funding subsection above.

Road assessments are planned in 2012 and 2014 and priorities adjusted as needed.

A review of street age, potential building and potential changes in traffic levels for the next 5 year period from 2015-2020 was conducted. By 2020 only 4 roads would be at or over 20 years old if no further work was done beyond that identified in this plan. More than adequate funds should be available during the period to resurface these roads as needed.

Traffic patterns may change with the improvements on Barry Road. Until the construction is completed this is difficult to accurately determine. Continued construction on West Ridge also may alter traffic patterns and again until this happens it can not be accurately determined what the impact would be on this road plan. As a result we will continue the routine assessments and respond as appropriate.

Another aspect of street repair is that of over weight trucks. It is one of the reasons for having a single provider for trash, as multiple providers means a significant increase in heavy truck traffic, which can be very detrimental to the roads.

Attachment 1

Road Database

Name	Condition Rating	Date Last Resurfacing	Thickness
East Side Roads			
72 Street	9	1990 2009	3" cap, total 7 inches
72 Terrace	9	1990 2009	3" cap, total 7 inches
73 Street	8	1999	2" cap, total 4 inches
73 Terrace Whipple to Eastside	9	1989 2009	3" cap, total 7 inches
73 Terrace Dam to Whipple	9	1989 2009	3" cap, total 7 inches
74 Street	9	1989 2009	3" cap, total 7 inches
75 Street	8	1996 2007	2" cap, total 6 inches
75 Terrace	7	1996 2007	2" cap, total 6 inches
76 Terrace	3	1989	2" cap, total 4 inches
77 Street	2	1989	2" cap, total 4 inches
77 Terrace, west side	8	1999	2" cap, total 6 inches
78 Street, east side	4	1989	2" cap, total 4 inches
78 Street, west side	9	1991 2009	3" cap, total 7 inches
79 Street	7	1998	2" cap, total 6 inches
80 Street	8	1991 2005	2" cap, total 6 inches
80 Terrace	8	1991 2002	2" cap, total 6 inches
Barr Lane 7912 and North	8	<1989 2002	2" cap, total 4 inches
Barr Lane South of 7912	6	1997	2" cap, total 4 inches
City Hall (and shop road)	9	2009	4" to 8" total
Davis Court	9	1989 2009	2" cap, total 5 inches

Eastside Drive	6	*2000	2" cap, total 6 inches Barry to 76 th Terrace
	5	*1993	2" resurface 76 th Terrace to 75 th Terrace
	9	*2009	2" resurface 75 th Terrace to City entrance on Blair Rd
Forest Drive	7	<1989 2005	2" cap, total 6 inches
McDonald	9	1990 2009	3" cap, total 7 inches
Moser Drive			
Quincy Court	9	<1989 2009	2" cap, total 5 inches
Rocky Point Drive	8	<1989 2005	2" cap, total 6 inches
Scenic Drive	8	???????? 1998	2" cap, total 6 inches
Whipple Lane	9	1989 2009	3" cap, total 7 inches

West Side Roads

75 Street	9	1989 2007	2" cap, total 8 inches
75 Terrace, south of Kerns	9	1989 2007	2" cap, total 8 inches
75 Terrace, west of Kerns	9	1989 2007	2" cap, total 8 inches
76 Street	9	1989 2009	2" cap, total 6 inches Westside to end
82 Street	7	1989 2001	2" cap, total 6 inches Potomic to N Miami
82 Terrace	7	<1989 2001	2" cap, total 6 inches
Community Center	5	1995	2" cap, total 4 inches
High Point	8	1991 2000	2" cap, total 6 inches
Hillside Drive	7	1991 2002	2" cap, total 6 inches
Kerns	4	1989 1997	2" cap, total 4 inches
Lynns Lane	7	<1989	2" cap, total 8 inches
Miami north	7	<1989 2001	2" cap, total 6 inches N Miami to 82 nd Terrace
Miami south	10	1995 2009	3" cap, total 7 inches
Pleasant Ford	9	1990 2009	3" cap, total 7 inches

Potomac Road	6	1990 2001	2" cap, total 6 inches Barry to 82 nd Street
Roberts Road, 8106 and north	9	1989 2009	2" cap, total 6 inches
Roberts Road, 7807 to 8106	9	2007	2" cap, total 8 inches
Roberts Road, 7804 and south	7	1989	2" cap, total 8 inches
Venita Drive 8013 and north		2002	Base (new) total 6 inches
	9	2009	2" cap
Venita Drive 8011 and south	9	1995 2009	3" cap, total 7 inches
Wayland Circle	9	1990 2009	3" cap, total 5 inches
Wayland Drive	7	1991 2002	2" cap, total 6 inches
Westside Drive	9	1990 2007	2" cap, total 6 inches
Weatherby Drive	9	1989 2009	2" cap, total 8 inches

* The history on Eastside Drive is incomplete but from 1991 to 1993 it was resurfaced from Barry Road to 7616 Eastside Dr

Rating system

Surface rating	Visible distress*	General condition/ treatment measures
10 Excellent	None.	New construction.
9 Excellent	None.	Recent overlay. Like new.
8 Very Good	No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4").	Recent sealcoat or new cold mix. Little or no maintenance required.
7 Good	Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open 1/4") due to reflection or paving joints. Transverse cracks (open 1/4") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6 Good	Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open 1/4"–1/2"), some spaced less than 10'. First sign of block cracking. Sight to moderate flushing or polishing. Occasional patching in good condition.	Shows signs of aging. Sound structural condition. Could extend life with sealcoat.
5 Fair	Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open 1/2") show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition.	Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2")
4 Fair	Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3 Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.
2 Very Poor	Alligator cracking (over 25% of surface). Severe distortions (over 2" deep). Extensive patching in poor condition. Potholes.	Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.
1 Failed	Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

* Individual pavements will not have all of the types of distress listed for any particular rating. They may have only one or two types.

Attachment 3

Cost estimate for 2012						
Street	Length (ft)	Resurface	PetroMat	Milling	Patching	Total
Eastside	1800	38,102		9,600	1,102	48,804
Kerns	1445	30,588		7,706	6,302	44,596
76 Terrace	773	*57,270				*57,270
77 Street	521	*42,276				*42,276
78 Street east side	428	7,927		1,997		9,924
Patching on various streets					306Tons 82,082	82,082
Total						284,952

Cost estimate for 2015						
Street	Length	Resurface	PetroMat	Milling	Patching	Total
Lynns Lane	737	29,640		7,688	6,000	43,328
Roberts South	1600	56,549		14,665	11,200	82,414
Barr Lane South	350	7,122		1,848	1,500	13,163
Patching on various streets					95,000	95,000
Total						233,905

* Complete road rebuild with 6" base and 2" cap of asphalt